

## TECHNICAL APPENDIX

### Implementation Plan for Elk Valley Area-Based Management Plan

- The EVWQP is an area-based management plan for the Elk Valley. It is intended to stabilize and reverse increasing concentrations of selenium, nitrate, cadmium and sulphate resulting from the operation of Teck Coal Ltd (Teck) mines in the Elk Valley.
- After the BC Ministry of Environment and Climate Change Strategy (ENV) approved the EVWQP in 2014, Permit 107517 was issued to require Teck to implement the EVWQP.
- Amendments to relevant *Mines Act* permits have also been issued to incorporate plan requirements, including adjustments to bonding.
- The EVWQP includes targeted Site Performance Objectives (SPOs) for each management unit in the Elk Valley watershed. Permit 107517 requires these SPOs be met and sets Compliance Limits specific to each Teck operation at key locations.
- An implementation plan adjustment (IPA) has been submitted, which provides information regarding Teck's plans for water treatment implementation to work towards compliance with Permit 107517 and the targets set out in the EVWQP.
- The implementation plan must be updated at least every three years to reflect updates to the regional water quality model, mine plans, and planned mitigations to achieve EVWQP targets.
- The number, timing and location of treatment plants in the initial implementation plan was based on the first regional water quality model and the 2013 mine plan. The IPA mitigation schedule is based on an updated model and mine plans, both of which have undergone revisions that affect what is needed to meet the EVWQP targets. The IPA planning period goes a decade beyond what the initial implementation plan (IIP) contemplated and sets out a plan for an additional 60 percent treatment capacity over what the IIP sets out. The number of treatment centres remains at six; however, the IPA accounts for additional expansion of the treatment capacity at each treatment centre in a phased approach. Note that these expansions essentially require parallel additions using flowsheets and component scale similar to that established at the existing West Line Creek Active Water Treatment Facility (AWTF).
- The final IPA, absent certain information about proprietary technologies, will be made publicly available and will be used to inform any regulatory action and direction to Teck for next steps to address outstanding issues and future implementation plan updates.

### Water Treatment and Environmental Performance

- The West Line Creek AWTF in its current configuration is operating at capacity, meeting permit limits for total selenium and nitrate, and addressing selenium speciation concerns that led to the plant being shut down in 2018. The addition, an advanced oxidation step to treat selenite and organo-selenium has proved effective and these compounds have consistently been within expectations since the plant was re-commissioned in the fall of 2018.
- Based on the successful implementation of advanced oxidation at the West Line Creek AWTF, the Fording River South Phase I treatment plant design was confirmed, and construction is well underway to meet a December 31, 2021 fully effective operation date. Other AWTF design and engineering work is following the same addition of advanced oxidation to the treatment process to ensure no issues arise related to selenium speciation. Further research is underway at the West Line Creek AWTF to optimize treatment and achieve selenium concentrations lower than present permit limits to contribute to long term targets set out in the area-based management plan.

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- Teck has also advanced saturated rock fill (SRF) as a treatment process to the large-scale trial stage. An SRF at Elkview Operations has been operating since January 2018 and treats up to 10,000 cubic metres of mine contact water per day. Teck wishes to progress to a second phase of the trial and treat up to 20,000 cubic metres per day of Erickson Creek water, the source targeted for phase I of the Elkview AWTF. As a result, Teck has notified ENV and the BC Ministry of Energy, Mines and Petroleum Resources (EMPR) that they will suspend further work on advancing construction of an AWTF at Elkview Operations. Construction of water intakes and pipelines for Erickson Creek water will continue. If the SRF treatment is successful as demonstrated by the large-scale trial, Teck will be able to meet EVWQP targets set for Elkview operations by December 2020, as per Permit 107517, versus a delay of two years for treatment via an AWTF.
- The IPA projects that selenium, nitrate, and sulphate will meet targets in the near and long term for the lower Elk River (measured at the Elko Order Station). Monitoring conducted since the approval of the EVWQP indicates average selenium concentrations less than ten micrograms per litre (about half the site performance objective), and the regional model predicts longer term declining values to about five micrograms per litre as mitigations are implemented.

### **Review of New Mining Projects and Major Expansions**

- When a major project is proposed in British Columbia, it must undergo an Environmental Assessment. This process ensures that any potential environmental, economic, social, heritage and health effects that may occur during the lifetime of a major project are thoroughly assessed.
- Environmental Assessments are managed by the BC Environmental Assessment Office (EAO), a neutral regulatory agency within the provincial government that works with and seeks input from scientific professionals, Indigenous Peoples, proponents, the public, local governments, and federal and provincial agencies to ensure that no adverse effects are missed.
- BC has agreements with Montana, Washington and Alaska regarding projects requiring Environmental Assessments that may have transboundary effects. These agreements specify opportunities for the US jurisdictions to participate in BC's Environmental Assessment process.
- In November 2018, a new BC *Environmental Assessment Act* (EA Act) was passed and is planned to be implemented in fall 2019.
- The three objectives of the new EA Act are:
  - Enhancing public confidence;
  - Advancing reconciliation with First Nations; and
  - Protecting the environment while offering clear pathways to sustainable project approvals.
- Specific changes in the new EA Act that support public confidence include:
  - Required matters that must be considered in each Environmental Assessment, including cumulative effects;
  - Ability to require reports on effectiveness of mitigation measures and update certificates based on the results of those reports; and
  - New tools to enhance the EAO's compliance and enforcement program, including administrative monetary penalties up to \$750,000.

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- Specific changes in the new EA Act that advance reconciliation and support the United Nations Declaration on the Rights of Indigenous Peoples include:
  - Requirement for the EAO to seek to achieve consensus with participating Indigenous Peoples throughout the EA process;
  - Opportunity for participating Indigenous Peoples to notify the EAO of consent or lack of consent at two key decision points; and
  - Creation of a time bound, non-binding dispute resolution to help reach consensus, if requested.
- The EVWQP must be considered by applicants for Environmental Assessment certificates for projects in the designated area. The plan is also considered by the Province when reviewing Environmental Assessment applications to ensure consistency with its goals and strategies. The implementation plan applies only to Teck; other companies are expected to develop their own plans to ensure consistency with the EVWQP.

### Enhancing Transparency

- Ministries continue to enhance transparency through public reporting and have made considerable progress. For example:
  - The joint EAO, EMPR, and ENV [BC Mine Information Website](#) includes authorizations, inspection reports, dam safety inspections, emergency response plans and related documents;
  - ENV reports compliance and enforcement actions, as well as inspection reports under the *Environmental Management Act* (EMA), on the [Natural Resources Compliance and Enforcement Database](#);
  - [Natural Resource Environmental Compliance Twitter account](#), highlighting key activities and accomplishments;
  - ENV continues to provide an “Overview on the Mining Sector” in annual [EMA Compliance Reports](#). This currently provides three years of data to inform trends;
  - Under the [Mining Compliance and Enforcement Strategic Plan](#) the ministries publish an [annual operating plan and annual report](#) on progress;
  - EMPR publishes estimated liability and the security held for metal and coal mines in the [Chief Inspector of Mines’ Annual Reports](#);
  - Monitoring data collected by ENV or reported electronically to ENV as a permit condition is made publicly available through the ministry’s [EMS database](#);
  - All authorizations issued under EMA are publicly viewable on the [ENV website](#); and
  - Teck Coal is also required to make certain information publicly available and posts reports to their own [website](#). Teck is also required to work with an Environmental Monitoring Committee that includes provincial and KNC representatives, as well as an independent scientist

### **Collaboration with US Agencies on Monitoring in Koocanusa Reservoir**

- The foundation of BC-Montana collaboration on regional ecosystems and shared protection of transboundary waters is captured in the Environmental Cooperation Arrangement Between the Province of British Columbia and the State of Montana and underpinned by the Memorandum of Understanding and Cooperation on Environmental Protection, Climate Action and Energy, which also provides for reciprocal opportunities for Montana to participate in BC's Environmental Assessment process.
- In recent years our relationship with Montana has been focused on assessing and managing transboundary impacts from mines in the Elk Valley through the Lake Koocanusa Research and Monitoring Working Group (LKRMWG).
- The LKRMWG is a cross-border forum through which site-specific criteria and water quality guidelines for the Koocanusa Reservoir are discussed and recommended, as well as a forum for discussing cumulative effects in the watershed. It has established common resources for open sharing of data and information by our two jurisdictions.
- The LKRMWG includes representatives from US federal and state agencies, First Nations and US Tribes, stakeholders, industry, non-governmental organizations and experts.
- The LKRMWG is currently working towards finalizing a draft water quality objective/criteria for selenium in Lake Koocanusa, targeting completion by 2020. By working closely with Montana and the other LKRMWG members, BC is working to establish a common water quality objective/criteria for selenium on both sides of the border. Additional objectives/criteria for other substances could also be developed in the future (note the equivalent of BC's water quality objectives are called water quality criteria in Montana).
- Participation and support from First Nations is very important to BC. Working closely with Montana we have recently expanded the role of representatives from First Nations and US Tribes on a key technical sub-committee. BC is also beginning discussions with the Ktunaxa Nation Council to explore pathways for collaborative development of the final water quality objective that will be implemented in the BC portion of Koocanusa Reservoir.
- Outcomes of LKRMWG's work will be incorporated into the EVWQP. At present, the EVWQP addresses water quality in the designated area (the BC portion of the watershed). The establishment of water quality objective/criteria for selenium for the whole of the Koocanusa Reservoir will provide targets for planning to ensure required mitigation measures support attainment of these objectives throughout the reservoir.
- In addition, BC and Montana recently established the Koocanusa Reservoir Transboundary Monitoring Task Group as a collaborative project. The task group is working to facilitate joint monitoring efforts across the border by addressing logistical and regulatory challenges posed by the international boundary. This two-year project is promoting transparency and shared data between our jurisdictions.
- BC and Montana are also working to finalize a Memorandum of Understanding that will provide further guidance and support to the LKRMWG and its members.